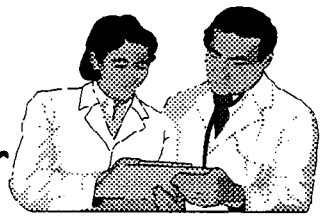
LabLink



Laboratory Information from the Michigan Department of Community Health

Vol. 2, No. 1 July 1996

The Public Health and Clinical Laboratories in the Era of Managed Care

Frances Pouch Downes, Dr.P.H.

The advent of managed care is forcing many health care providers, including laboratories, to shift paradigms-- the way we see the world. Networking is now preferred to competition. A large testing volume is no longer a measure of a laboratory's vitality. Patient outcomes are preferred as an indicator of a laboratory's efficiency.

For public health, managed care presents opportunities and challenges. The Michigan Department of Community Health Laboratory is also reexamining and revising the role it will have in the emerging health care environment. The challenge is maintaining and enhancing the fundamental population-based activities of public health. The opportunity is to forge new partnerships for prevention and monitoring for diseases of public health importance.

As an initial step in forging partnerships, the Michigan Department of Community Health Bureau of Laboratories in conjunction with the Michigan Public Health Institute is launching an initiative to bring together leaders in the Michigan clinical laboratory community to define the role of the medical laboratory in the evolving health care system in Michigan. Public health is organizing this effort because of the impact that laboratory practices have on diverse public health programs. Policies are being developed that will influence health resource allocation and delivery systems. Government agency restructuring, technology, revised medical care priorities are all influencing how and where laboratories provide services. We believe that the Michigan medical laboratory community should lead health care policy development related to assurance of quality testing and to access to appropriate testing.

Historically, the medical laboratory community has not joined forces for cooperative, long-range planning or policy development. This initiative is intended to foster discussions of issues of concern for the broader medical laboratory community, to assess the impact of health care reform on laboratory practice, and to develop policies. The initial meeting will focus discussions on the following issues:

- the impact of governmental structure on medical laboratories
- laboratory regulations
- personnel resources and credentialling
- utilization of new computer and scientific technology
- electronic laboratory surveillance

Participants will include leaders from professional organizations, representatives of both rural and major medical center laboratories, academia, manufacturers of laboratory tests, health care plans, representatives of local health departments, and the private laboratory industry.

INFLUENZA ACTIVITY SUMMARY -- MICHIGAN & THE UNITED STATES, 1995-96
Bureau of Infectious Disease Control/Michigan Department of Community Health
prepared May 1996

To monitor influenza activity throughout the state, the Disease Surveillance and Virology Sections of the Bureau of Infectious Disease Control seek information from local health departments, and clinical laboratories in Michigan. This report summarizes reported influenza activity in Michigan during the 1995-96 season and compares it to nationally reported influenza activity.

Influenza activity began in November 1995 in Michigan and reports of activity peaked in early January. This temporal pattern was similar to what occurred nationally in the 1995-1996 season. The first isolate received was an Influenza A (untyped) from Kalamazoo. During the course of the season, influenza isolates were received from the following counties: Genesee, Grand Traverse, Gratiot, Ingham, Kalamazoo, Kent, Muskegon, Oakland, Schoolcraft, St. Joseph, and Wayne (city of Detroit). Telephone reports of isolates (untyped) were also received from Clinton and Leelanau counties. Total influenza isolates received through April 30, 1995 were 46, with the greatest number (18) arriving in January, followed by February, with 13 submitted during that month.

Of the 46 influenza isolates subtyped at the Michigan Department of Community Health Laboratory (MDCH), 25 (54%) were influenza A (H1N1) Taiwan-like or Texas-like; 12 (26%) were influenza A (H3N2) Johannesburg-like; 6 ((13%) were influenza B, Beijing-like; and 3 (7%) were unavailable to subtype. Thus, all 3 strains circulated in Michigan this past season. These were the viruses that had been included in the 1995-96 influenza vaccine. An additional 11 respiratory viruses were isolated: parainfluenza type 1 (8), parainfluenza type 2 (1), adenovirus (1) and cytomegalovirus (1).

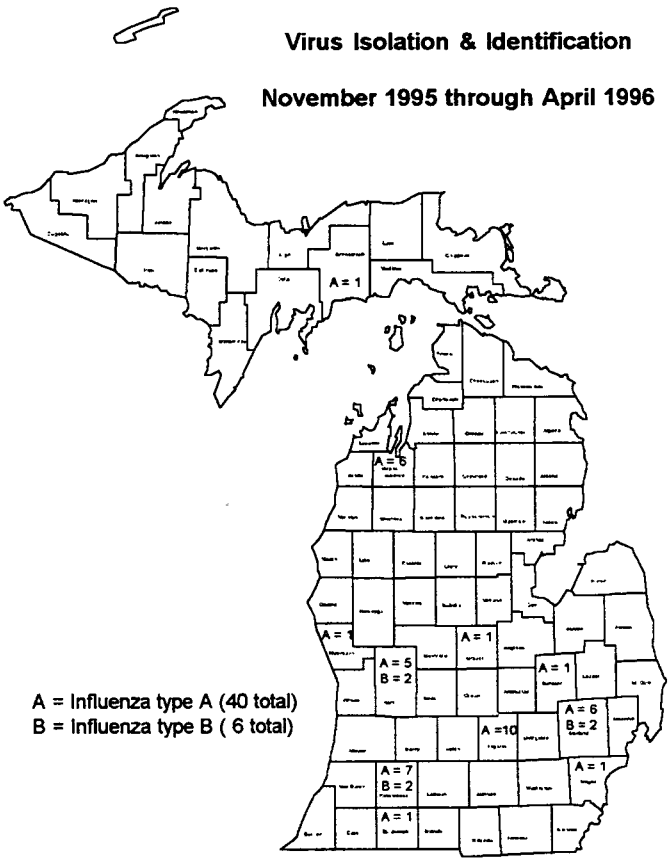
Throughout the United States, of 4132 influenza virus isolates reported to the Centers for Disease Control & Prevention (CDC) from October 1, 1995 through march 30, 1996, a total of 3786 (92%) were influenza A and 346 (8%) were influenza B. Of the 2146 typed A isolates that were subtyped, 1427(59%) were type A (H1N1) and 989 (41%) were type A (H3N2). Both in Michigan and the United States as a whole, although the total number of influenza isolates began to decline in February, the number and proportion of influenza B isolates began to increase. In Michigan, the first influenza B was submitted from Oakland county on February 14, 1996, and isolates continued to be identified into May. This late season surge in influenza B activity may provide us with insight into next year's strains.

Influenza activity occurred at moderate to severe levels during the 1995-96 season in Michigan, with activity peaking shortly after the new year. The ages of the majority of the isolates received at the MDCH laboratory were either children or working-age adults. No reports of confirmed influenza outbreaks were received from any nursing home this past season. This would appear to indicate either previous exposure to these strains, or effective influenza immunization in the age group over age 65.

The Food & Drug Administration has recommended that the 1996-97 trivalent influenza vaccine for the United States contain A/Wuhan/359/95-like(H3N2), A/Texas/36/91-like(H1N1), and B/Beijing/184/93-like viruses. This recommendation was based on the antigenic analysis of recently isolated influenza viruses, and the antibody responses of persons vaccinated with the 1995-96 vaccine. The influenza A (H3N2) component is a change from the previous year's vaccine, but the influenza A (H1N1) and the influenza B strains have been retained.

We thank the local health departments and hospital laboratories who contributed specimens or information to our department. Your assistance is extremely important; obviously this report would not be possible without your contributions. We invite your continued contributions for the 1996-97 season and would encourage local health departments and laboratories that have not contributed information recently to call/fax our office, or to submit isolates for subtyping next season.

MDCH LABORATORY INFLUENZA SURVEILLANCE



Antimicrobial Resistance Trends
Penicillin Resistant Study-site[1] Isolates of *Streptococcus pneumoniae*
and Vancomycin Resistant Sterile-site[2] Isolates of *Enterococcus spp.*
Michigan Sentinel Hospital Laboratory Survey, Third Quarter, 1995 through First Quarter, 1996

Microorganism	Resistance Classification[3]	Percent Resistant[3] Statewide (Region One only) 1995 Quarters Third	1995 Quarters Fourth	1996 Quarters First
Str. pneumoniae	Moderate or High	17(20)	16(20)	19(20)
Str. pneumoniae	High Level only	6(6)	3(4)	3(5)
E. faecalis	Resistant	1(1)	1(1)	2(2)
E. faecium	Resistant	22(24)	35(45)	31(37)
Total Enterococcus	Resistant	4(7)	5(8)	7(9)

[1] Study sites = blood, CSF, deep surgical wound, pleural fluid(fl), peritoneal fl, respiratory specimens or synovial fl.

[2] Sterile sites = blood, CSF, deep surgical wound, pleural fluid(fl), peritoneal fl, or synovial fl.

[3] NCCLS, Performance Standards for Antimicrobial Susceptibility Testing, Volume 14, Number 6.

Penicillin resistance in *Streptococcus pneumoniae* and Vancomycin- resistance in *Enterococcus* represent increasingly important threats to health in the United States. The Disease Surveillance Section and the Microbiology Section of the Department of Community Health are collaborating with 33 hospital-based microbiology laboratories to monitor trends in the prevalence of these agents in Michigan. Under this program the microbiology laboratories enrolled in the study complete a standard survey form and submit a limited number of resistant isolates they identify each quarter. The most current summarized survey information will be routinely reported in each issue of the LabLink.

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Cyclospora, What is it?

Susan L. Shiflett, Parasitologist

Due to recent press coverage, *Cyclospora cayetanensis* has become a popular topic of conversation. The Microbiology Section at the Michigan Department of Community Health has received many calls requesting information on this organism.

The most common inquiry is whether or not we have diagnosed *Cyclospora cayetanensis* in the state of Michigan. The answer is yes. This must be followed by the footnote that all cases of *Cyclospora cayetanensis* sent to the state for isolation or confirmation have been acquired outside the state of Michigan. Recent isolates seen at the department have come from patients traveling to West Palm Beach, Florida, Houston and San Antonio, Texas, and to Ireland.

What exactly is *C. cayetanensis?* It is a coccidian parasite that was first identified as a cause of infection in humans in 1977. Until 1995, there had only been three documented outbreaks of *Cyclospora cayetanensis*. The first documented outbreak in the United States occurred in 1990 at a Chicago hospital. The water supply in the physicians dorm was epidemiologically implicated as the source of infection.

In the laboratory, the oocyst can be demonstrated in stools by examining the sediment resulting from an ova and parasite concentration procedure. It ranges from 8 to 10 μm, approximately twice the size of *Cryptosporidium parvum. C. cayetanensis* have variable reactions with the modified acid-fast stain and demonstrate autofluorescence with ultraviolet epiflourescence.

C. cayetanensis is transmitted like most other gastrointestinal pathogens, by means of fecal-oral contamination. Unlike other organisms, *Cyclospora cayetanensis* in not infectious at the time it is excreted in the stool of an infected person. The parasite does not become infectious until days or weeks later depending on the environmental conditions. Because of this, person-to-person transmission is unlikely. It is not known at this time if animals can be infected or serve as a source of infection for humans.

C. cayetanensis infects the small intestine and typically causes an illness characterized by a loose, watery diarrhea similar to that seen with a *Cryptosporidium parvum* infection. Patients will pass up to seven stools a day. Other symptoms include fatigue, anorexia, stomach cramps, vomiting, myalgia, and weight loss. There may be a remission of the self-limiting diarrhea in 3 to 4 days only to be followed by relapses lasting up to four weeks or longer.

Unlike infections with *Cryptosporidium parvum, C. cayetanensis* infections may be treated with a seven day course of trimethoprim-sulfamethoxazole. Anti-coccidian therapy for patients that are sensitive to sulfa drugs has not been identified.

Consumption of fresh fruit has been implicated as the mode of transmission in the recent outbreaks of *C. cayetanensis*. No standardized methods for examining food specimens for the presence of *Cyclospora* are available at this time. The Michigan Department of Community Health, along with the FDA, CDC, and other laboratories have tried, unsuccessfully, to isolate *Cyclospora cayetanensis* from fresh strawberries originally suspected as the vehicle of infection in the current outbreak. Even though it may not completely eliminate the possibility of infection with *Cyclospora*, fresh produce should be washed before it is consumed.

Because of the increased recognition of *Cyclospora cayetanensis* infections, health care providers should consider this organism in cases of prolonged and recurring diarrheal illness, and should request laboratory testing for this parasite.

E. coli 0157:H7, the New Kid on the Block

Kirsten A. White, MT(ASCP)

Escherichia coli 0157:H7 is one of the newly recognized pathogenic organisms that invade the human gastrointestinal tract. Questions have risen about this organism at the MDCH U.P. Laboratory due to isolated cases in the Upper Peninsula (although this organism is diagnosed throughout the state). What is *E. coli* 0157:H7 and how is it different from other *E. coli*? How is the illness associated with this organism similar to or different from that caused by other gastrointestinal pathogens? What is the proper way to test for *E. coli* 0157:H7?

Escherichia coli is a gram-negative, lactose fermenting bacterium that is a common inhabitant of the human gastrointestinal tract. *E. coli* may be present as normal flora in the human body, but many do not realize this as it has been implicated in so many different infections. Whether or not *E. coli* is pathogenic depends on what strain it is, as well as where in the body the organism resides, and in what numbers with relation to other bacteria normally found in these places. There are many different strains of *E. coli*. Not all *E. coli* are serogroup 0157, and not all *E. coli* 0157 are serogroup H7. The O serogroup refers to the antigens on the cell wall of the organism, while the H serogroup refers to the flagellar antigens of the organism.

In North America, 0157:H7 is the most frequently isolated diarrheagenic type of *E. coli* [1]. It can cause serious, if not fatal, disease. It does this by producing a shiga-like toxin , or SLT, which is similar to the toxin produced by *Shigella dysenteriae*. This toxin is responsible for the syndrome known as hemolytic uremic syndrome, or HUS. The characteristics of HUS include nonimmune hemolytic anemia, thrombocytopenia, and acute renal failure. Other conditions associated with *E. coli* 0157:H7 include diarrhea and hemorrhagic colitis.

The most common vehicle of transmission implicated in infection with *E. coli* 0157:H7 has been uncooked or undercooked ground beef, though other vehicles have been described. It takes relatively low numbers of this organism to cause symptomatic illness, and victims are more likely to be contagious in the early stages of the disease before major symptoms occur. Therefore, it must be emphasized that good personal hygiene and universal precautions be used whenever contact is made with patients suspected of having an infection with *E. coli* O157:H7 or when handling human stool specimens.

Screening for *E. coli* 0157 is routinely done on all stool samples submitted to the Michigan Department of Community Health Laboratories (in both Lansing and Houghton) for diagnosis of bacterial infections. Stools are collected and transported in the same manner as stools suspected of containing other pathogens such as *Salmonella* and *Shigella*. When the stool specimens arrive in the laboratory, they are inoculated onto sorbitol-MacConkey agar, along with other selective and differential media. *E. coli* 0157:H7 does not ferment sorbitol; most other strains of *E. coli* do. Specimens that are found to be positive for the 0157 serotype are then typed for H7.

Hopefully, this has answered some of the basic questions about *E. coli* 0157:H7. If more information is desired, the reference article contains detailed material about the history, pathogenic properties, nomenclature, and clinical aspects of infection due to this and related organisms. In addition, the Centers for Disease Control and Prevention (CDC) has an excellent videotape, "*E.coli* 0157:H7, What the Clinical Microbiologist Should Know" available through the Association of State and Territorial Public Health Laboratory Directors (ASTPHLD) by calling (202)822-5227. Copies of the videotape are also available from the lending library at the Michigan Department of Community Health. To borrow one, contact Ms. Sue Shiflett, at (517)335-9763.

[1]Tarr, Phillip I. *Escherichia coli* 0157:H7: Clinical, diagnostic, and epidemiologic aspects of human infection. Clinical Infectious Diseases, 1995; 20:1-10.

(Ed. note--MDCH is currently conducting research comparing different methods of SLT I and SLT II toxin testing. This will be a routine service at MDCH in the future)

Data and Specimen Handling

Steve Betterly, DASH Unit Supervisor

Important changes regarding how the Data and Specimen Handling (DASH) Unit prints and distributes all completed laboratory test reports have recently occurred.

The MDCH Laboratory Services Division has been using the EPIC laboratory information system for the Microbiology Section's specimens for over a year with great success. The EPIC system significantly improves our specimen tracking, testing, and result reporting. As of July 1, 1996, the Virology Section added the EPIC system to its operation. Now all 200,000 clinical specimens submitted to the Laboratory Services Division for testing will be entered into EPIC.

Submitters no longer receive their original test requisition form with test results noted. Instead, submitters will now receive an EPIC-generated result report. Because submitting agencies will not get back their original test requisition form, it is very important that submitters clearly identify any patient identification or specimen identification numbers associated with the submitted specimen. These will be noted on the computer-generated result report.

One important benefit of using the EPIC system is that test result reports via FAX are now possible when certain security and equipment conditions are met. A 24 hour dedicated FAX phone line or computer with a 24 hour dedicated FAX modem with appropriate receiving software must be available for MDCH access. The receiving FAX machine or computer must be in a secure environment to ensure the confidentiality of incoming test results at all times. The receiving agency must be aware that all reports from the Laboratory Services Division will be sent by fax. This means that Fax Agencies will not receive any reports through the mail and must agree to receive all their test results via FAX. Agencies wishing to set up a FAX receiving station should contact, in writing, Mr. Mike Huntzinger, our EPIC System Administrator or myself. In your written request please confirm that your receiving FAX system is dedicated and secure for confidential reports.

Another change your agency may notice when submitting specimens to our Lab for testing, is our new FB200 Universal Virology test requisition form. We are now sending out this new universal test requisition form with all virology specimen collection kits. Please begin using this new FB200 universal virology test requisition form. Our universal form improves the transfer of patient and specimen information into our EPIC database. Please assist us in providing timely and accurate laboratory test results by always sending a separate specimen with each laboratory test requested. Separate specimens are particularly important with HIV, hepatitis B and syphilis specimen submissions.

Whenever possible, please order specimen and water sample collection kits by using our FAX at (517) 335-9871. You may FAX us whenever it is convenient to you and we can process your orders during our non-peak hours. You may direct any comments or questions regarding submitted specimens, result reports, FAX reporting requirements, and specimen container orders to us by telephone: (517) 335-8059; Fax: (517) 335-9871; or E-mail: BetterlyS@STATE.MI.US.

LabLink is published quarterly by the Michigan Department of Community Health to provide laboratory information to Michigan Health professionals and to the public health community.

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